

BE IT KNOWN that We, ***R. MAGDINA and B. JACKO***, have  
invented certain new and useful improvements in

***METHOD OF PAINTING, PAINT USABLE FOR THE METHOD, AND  
METHOD OF PRODUCING THE PAINT***

of which the following is a complete specification:

### CROSS-REFERENCE TO A RELATED APPLICATION

The application is a continuation-in-part of patent application serial no. 10/023,949 filed on December 21, 2001.

### BACKGROUND OF THE INVENTION

The present invention generally relates to methods of painting, paints, and methods of producing paints.

5           Objects are painted with paints in industry, household, and other areas of modern life. Known paints usually include a film-forming binder component which provides formation of a film and adhesion to a substrate on which the paint is to be applied, and also include a color-producing component, such as for example pigments and other coloring agents. Therefore when the surfaces are painted with existing paints, they  
10           obtain corresponding colors.

          While the known paints provide a certain protection of surfaces on which they are applied from deleterious action of atmosphere and impart certain colors to the surfaces on which they are applied, they do not

adequately protect the surfaces of the substrates from the consequences of a fire. It is believed to be advisable to eliminate this disadvantage.

### SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a method of painting, a paint and a method of producing a paint which avoid the disadvantages of the prior art.

5                   In keeping with these objects and with others which will become apparent hereinafter, one feature of present invention resides, briefly stated, in a method of painting, comprising the steps of providing a paint including a film-forming binder component, a color-producing component, and a fire-retardant component; and painting a surface with said  
10 paint, so as to impart to the surface a corresponding color and also to substantially protect the surface from fire.

                  Another feature of the present invention resides in a paint which has a film-forming binder component; a color-producing component; and a fire-retardant component adapted to at least substantially protect from  
15 fire a surface of which the paint is applied.

Also, in accordance with a present invention a method for producing a paint is proposed, which has the steps of providing a film-

forming binder component; providing a color-producing component; and adding a fire retardant component to produce a paint which after painting the surface, imparts a corresponding color to the surface and also substantially protects the surface from fire.

5                               When the method of painting is performed, the paint is designed, and the method of producing the paint is implemented in accordance with the present invention, then in addition to conventional coloring of the surface by the paint, it also protects a surface of a substrate in which it is applied at least substantially from fire, and in many cases  
10                               increases a corrosion resistance, and lengthens the service life of the paint.

                              In accordance with a further feature of the present invention the fire retardant component includes at least one phosphate or its derivative, such as melamine polyphosphate, ammonium polyphosphate.

                              In accordance with still a further feature of the present invention  
15                               the fire retardant component includes melamine or its derivative selected from the group consisting of melamine cyanurate, melamine borate, melamine polyphosphate, melamine diphosphate, melamine pyrophosphate and melamine phosphate.

In accordance with still a further feature of the present invention, the fire-retardant component includes melamine, pentaerythritol, and melamine polyphosphate.

5           The novel features which are considered as characteristic for the present invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

In accordance with the present invention a paint is provided which has a film-forming binder component, a color-producing component; and in addition has a fire-retardant component adapted to least substantially protect from fire a surface of which the paint is applied. When a surface is painted with such a paint, it not only colors the surface in a corresponding color, but also protects the surface from consequences of fire.

The fire retardant component can include phosphate or its derivative such as melamine polyphosphate, ammonium polyphosphate.

Also, the fire retardant component can include melamine or its derivative such as melamine cyanurate, melamine borate, melamine polyphosphate, melamine diphosphate, melamine pyrophosphate and melamine phosphate.

In the paint in accordance with the present invention the fire retardant component can include a charring agent, which is for example pentaerythritol, mono-pentaerythritol or di-pentaerythritol a blowing agent

which for example is melamine, and an additional agent selected from the group of agents specified herein above.

5 It is to be understood that in addition to film generating substances (binding materials and softeners) which are one of the main components of paints which affect durability, shine, elasticity, bonding, flexibility and hardness, and also in addition to pigments which can be color powders not soluble in binders and soluble in color agents so as to create color variations and surface coloring capability the paint can also include volatile components which in combination with the binding materials create  
10 in most cases solution or so-called base lacquer (varnish). Also additives can be included in the paint, which are "helping" chemicals creating specific characteristics of the paints.

15 The paint in accordance with the present invention can be produced by a method which includes the steps of providing a film-forming binder component; providing a color-producing component, mixing said components with some of dried powder components missing; and adding a fire retardant component to replace the dry powder components.



In particular, fillers, such as for example calcium carbonate and titanium dioxide, are substituted by the fire retardant component. However, it is of course possible to substitute small amounts of film generating component.

5                    In the paint in accordance with the present invention additional components are introduced, including a filler and an additive, as will be shown in the examples.

10                   The fire-retardant component of the paint in accordance with the present invention can constitute not more than 15 weight % of the paint. This feature is very important, since as a result this fire-retardant component fully imparts fire-retardant properties to the paint, and at the same time does not detrimentally alter its composition, so that the major painting properties of the paint are fully retained.

15                   In accordance with a further feature of the present invention the fire-retardant component includes melamine, pentaerythritol and melamine polyphosphate. The ratio by weight of these ingredient of the fire-retardant component can be 35:35:30, and can include correspondingly 5.25, 5.25 and 4.50 weight % of total weight of the paint. The thusly formed fire-retardant

component is very efficient, and its content in the paint can be maintained at the level not more than 15% of the total weight of the paint.

The inventive paint which is used in the inventive method of painting and produced by the method in accordance with the present invention is illustrated by the following examples:

Example 1

Epoxy Paint-Two Components

Part A

	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
10	Liquid Epoxy Resin	Epotuf 37-127	32.80 Film Forming Binder
	Diluent	Benzyl Alcohol	3.75 Film Forming Binder
	Dispersant	BYK P-104S	0.32 Additives
	Anti-Crater Additive	BYK A-530	0.15 Additives
	Flow Additive	BYK 501	0.16 Additives
15	Prime Pigment	Titanox 2020	12.3 Color Producing Component
	Extender	Microna 7	18.99 Dry Powder Component
	Blowing Agent	Melamine	5.25 Fire Retardant Component
	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component
	Carbonific	Pentaerythritol	5.25 Fire Retardant Component

Part B

Polyamine Hardener	Epotuf 37-801	13.32	Film Forming Binder
Diluent	Benzyl Alcohol	<u>3.21</u>	Film Forming Binder
		100.00	

Mix Part A/Part B 4/1 by volume

## 5 Example 2

### Alkyd Undercoat

	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Medium Oil Aklyd 80%	Beckosol AA-203	31.48 Film Forming Binder
10	Solvent	Mineral Spirits	21.94 Volatile Component
	Dispersant	Soya Lecithin	0.13 Additives
	Thixotrops	Thixatrol ST	0.32 Thixotrope
	Sag Control	Post 4	0.44 Thixotrope
	Cobalt Drier	12% Cobalt Naphthenate	0.08 Additives
15	Calcium Drier	6% Calcium Naphtenate	0.78 Additives
	Anti-Skin Agent	Methyl Ethyl Ketoxine	0.33 Additives
	Prime Pigment	Tipure 902	21.40 Color Producing Comp
	Extender Pigment	Nicron 604	8.12 Dry Powder Component
	Blowing Agent	Melamine	5.25 Fire Retardant Component
20	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component
	Carbonific	Pentaerythritol	<u>5.25</u> Fire Retardant Component
			100.00

### Example 3

#### Urethane Enamel

	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Oil Modified Polyurethane	Spenkel F47-M-60	50.10 Film Forming Binder
	Dispersant	Nuosperes 657	0.46 Additives
5	Thixatrobe	Bentone SD-1	0.95 Thixotrope
	Solvent	Mineral Spirits	6.18 Volatile Component
	Prime Pigment	Tronox CR-828	23.90 Color Producing Comp
	Cobalt Drier	12% Cobalt Naphthenate	0.38 Additives
	Calcium Drier	6% Calcium Naphthenate	1.26 Additives
10	Zirconium Drier	24% Zirconium Naphthanete	1.61 Additives
	Anti-Skin Agent	Exkin #2	0.11 Additives
	Blowing Agent	Melamine	5.25 Fire Retardant Component
	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component
	Carbonific	Pentaerytritol	<u>5.25</u> Fire Retardant Component
15			100.00

#### Example 4

#### Strippable Vinyl Coating

	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Vinyl Resin High M.W.	Ucar YVNS	7.38 Film Forming Binder
20	Vinyl Resin Low M.W.	Ucar VYHD	3.69 Film Forming Binder
	Plasticizer	Diocetyl Phthalate	2.88 Film Forming Binder
	White Pigment	TiPure 902	6.50 Color Producing Component

	Diluent	Toluene	22.20 Volatile Component
	Ketone Solvent	Methyl Isobutyl Ketone	20.95 Volatile Component
	Acetate Solvent	Butyl Acetate	21.40 Volatile Component
	Blowing Agent	Melamine	5.25 Fire Retardant Component
5	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component
	Carbonific	Pentaerythritol	<u>5.25</u> Fire Retardant Component
			100.00

#### Example 5

#### Nitrocellulose Satin Lacquer

10	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Low MW Nitrocellulose	Nitrocellulose 1/4 sec	6.75 Film Forming Binder
	High MW Nitrocellulose	Nitrocellulose ½ sec	0.10 Film Forming Binder
	Diluent	Toluene	13.75 Volatile Component
	Lateral Solvent	Isopropanol	2.70 Volatile Component
15	Fast Solvent	Butyl Acetate	27.60 Volatile Component
	Slow Solvent	PM Acetate	2.70 Volatile Component
	Coconut Alkyd 70% in BA	Bookosol 91-470	12.78 Film Forming Binder
	Plasticizer	Diocetyl Phthalate	1.34 Film Forming Binder
	White Pigment	TiPure 902	9.80 Color Producing Comp
20	Crosslinker	Cymel 303	6.95 Film Forming Binder
	Crosslinker Catalyst	Butyl Acid Phosphate	0.53 Additives
	Blowing Agent	Melamine	5.25 Fire Retardant Component
	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component

Carbonific	Pentaerythritol	<u>5.25</u> Fire Retardant Component
		100.00

#### Example 6

#### Eggshell Latex Paint

5	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Solvent	Water	25.3 Volatile Component
	Dispersant	Potassium Triphosphate	0.22 Additives
	Surfactant	Igepal CO-630	0.84 Additives
	Defoamer	Colloid 643	0.23 Additives
10	Wet Edge Control	Propylene Glycol	2.77 Additives
	Biocide	Nuosept 95	0.38 Additives
	White Pigment	Tipure 902	18.14 Color Producing Comp
	Blowing Agent	Melamine	5.25 Fire Retardant Component
	Catalyst	Melamine Polyphosphate	4.5 Fire Retardant Component
15	Carbonific	Pentaerythritol	5.25 Fire Retardant Component
	Cellulosic Thickener	Bernocol E411 FQ	0.32 Thixotrope
	Latex Polymer 55%	Rovace 9100	34.88 Film Forming Binder
	pH Adjustment	28% Ammonia Hydroxide	0.13 Additives
	Associative Thickener	Acrysol RM-5	<u>1.82</u> Thixotrope
20			100.00

#### Method of Preparation

The above samples were prepared by a Cowles High Speed Disperser. Following a normal paint manufacture technique, the powdered materials were dispersed at highspeed into a suitable

amount of the vehicle which contained the dispersants and wetting agents. After the dispersion was complete the speed was reduced balance of the vehicle was added together with the remaining ingredients in the formula.

#### Example 7

#### 5 Acrylic Powder Coating

	<u>Function</u>	<u>Material</u>	<u>Weight %</u>
	Glycidyl Acrylic Polymer	Fine-Clad A-207-SA	56.90 Film Forming Binder
	Crosslinker	Dodecanedioic Acid	10.83 Film Forming Binder
	Flow Additive	Silwet L-7500	0.33 Additives
10	White Pigment	Titanox 2020	16.94 Color Producing Comp
	Blowing Agent	Melamine	5.25 Fire Retardant Component
	Catalyst	Melamine Polyphosphate	4.50 Fire Retardant Component
	Carbonific	Pentaerythritol	<u>5.25</u> Fire Retardant Component
			100.00

15 Bake Temperature: 20 minutes at 150 C.

#### Method of Preparation

Powders were mixed and blended using a W&P ZSK-30 Blender.

Barrel Temperature 60/80 C.

Screw Speed: 250 rpm.

20 Classification: 100% through 200 mesh.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of substances and methods differing from the types described above.

5 While the invention has been illustrated and described as embodied in paint, and method of producing the same, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

10 Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

15 What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.